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Route To:

Subject: Annual Insect and Disease Conditions Report

To: Director, Forest Health Technology Enterprise Team-Fort Collins

Enclosed is the CY 1997 Forest Insect and Disease Conditions Report for Region 3. Instructions for accessing the digital map files for western spruce budworm and mountain pine beetle will be forthcoming.

/s/ Jim Dick for
MARLIN JOHNSON
Acting Director of Forestry and Forest Health

Enclosure

cc: Douglas L. Parker
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Conditions in Brief

In the Southwest, bark beetle-caused tree mortality increased from 53,610 acres in 1996 to 91,235 acres in 1997. Tree mortality in the lower elevation pinyon-juniper forest cover type (woodlands) was caused by pinyon Ips beetles (17,420 acres); in the ponderosa pine forest cover type, tree mortality was caused by the roundheaded pine beetle (18,435 acres), Ips beetles (22,640 acres), western pine beetle (12,210 acres), and mountain pine beetle (10,080 acres). In the higher elevation mixed conifer and spruce-fir forest cover types, tree mortality was caused by Douglas-fir beetle (4,455 acres), fir engraver/western balsam bark beetle complex (4,345 acres), and spruce beetle (1,650 acres).

Insect defoliator activity Region-wide increased from 176,415 acres in 1996 to 266,395 acres in 1997. This defoliation was caused by the western spruce budworm (217,510 acres), spruce aphid (27,970 acres) and a complex of large aspen tortrix, western tent caterpillar, marssonina leaf spot, and possibly abiotic factors (20,915 acres).

Dwarf mistletoes continue to be the primary cause of growth loss (other than overly dense stocking) in both the ponderosa pine and mixed-conifer cover types. The estimated annual volume loss from these parasites is 25 million cubic feet. Their incidence has probably increased over the past century.

Root diseases cause an estimated 5 million cubic feet of volume loss annually and create hazard trees in campgrounds and along roadways. The most common root diseases in the Southwest are armillaria and annosus. Incidence is higher in mixed-conifer and spruce-fir forests than in ponderosa pine forests. Like other native diseases including mistletoes, root and butt rots can be beneficial for some wildlife species.

White pine blister rust occurs throughout most of the range of southwestern white pine on two Ranger Districts of the Lincoln National Forest and the Mescalero Apache Indian Reservation in southern New Mexico. It has not yet been detected elsewhere in the Region.

Insects: indigenous
Douglas-fir Beetle, *Dendroctonus pseudotsugae*
Arizona, New Mexico
Host: Douglas-fir

Douglas-fir beetle-caused tree mortality increased from 835 acres in 1996 to 4,455 acres in 1997. In Arizona, Douglas-fir beetle-caused mortality occurred on the Apache-Sitgreaves (3,665 acres), and Coconino (60 acres) National Forests and the Navajo (195 acres) and Fort Apache (535 acres) Indian Reservations. No Douglas-fir beetle activity was detected in New Mexico.

Insects: indigenous
Ips Beetle, *Ips* spp.
Arizona, New Mexico
Hosts: Ponderosa pine, Pinyon pine

Ips-killed ponderosa pines decreased from 30,230 acres in 1996 to 22,640 acres in 1997. In Arizona, tree mortality was detected on the Coconino (11,800 acres), Coronado (80 acres), Kaibab (610 acres), Prescott (1,205 acres), and Tonto (4,990 acres) National Forests and Fort Apache (40 acres) and San Carlos (3,530 acres) Indian Reservations. In New Mexico, *Ips*-caused tree mortality occurred on the Carson (120 acres) and Lincoln (265 acres) National Forests.

In Arizona, pinyon pine mortality resulting from *Ips* beetle attacks (*Ips confusus*) was detected on the Coconino (12,810 acres) and Kaibab (1,255 acres) National Forests and adjacent and nearby private (3,355 acres) lands. No pinyon *Ips* activity was detected in New Mexico.

Insect Complex: indigenous
Fir Engraver Beetle, *Scolytus ventralis*; Western Balsam Bark Beetle, *Dryocoetes confusus*
Arizona, New Mexico
Host: White Fir

Tree mortality caused by these bark beetles was detected on 4,345 acres in 1997 compared to 2,820 acres in 1996. Tree mortality on Federal lands in Arizona occurred on the Apache-Sitgreaves (920 acres), Coconino (1,660 acres), and Kaibab (895 acres) National Forests, Fort Apache (245 acres) Indian Reservation, and the Grand Canyon (5 acres) National Park. In New Mexico, fir engraver beetle-caused mortality occurred on the Cibola (45 acres), Santa Fe (75 acres), Gila (295 acres), and Lincoln (205 acres) National Forests.

Insects: indigenous
Mountain Pine Beetle, *Dendroctonous ponderosae*
Arizona, New Mexico
Host: Ponderosa pine

Mountain pine beetle-caused ponderosa pine mortality increased from 3,295 acres in 1996 to 10,080 acres in 1997. Most of this mortality occurred in the Grand Canyon National Park (10,000 acres). Smaller areas of mountain pine beetle-caused tree mortality also occurred on the Kaibab National Forest (10 acres) and the Arizona Strip District (Bureau of land Management, 15 acres) in Arizona and on the Santa Fe National Forest (55 acres) in northern New Mexico.

Insects: indigenous
Roundheaded Pine Beetle, *Dendroctonus adjunctus*
Arizona, New Mexico
Host: Ponderosa pine

Roundheaded pine beetle-caused tree mortality increased nearly two fold from 9,340 acres in 1996 to 18,435 acres in 1997. Mortality from roundheaded pine beetle attacks in Arizona occurred on the Fort Apache Indian Reservation and totaled 6,650 acres. In New Mexico, roundheaded pine beetle-killed trees were detected on the Lincoln National Forest (6,575 acres) and Mescalero Apache Indian Reservation (5,210 acres).

Insect: indigenous
Spruce Beetle, *Dendroctonus rufipennis*
Arizona, New Mexico
Host: Spruce

Spruce beetle-caused tree mortality increased over two fold from 615 acres in 1996 to 1,650 acres in 1997. In Arizona, spruce beetle-killed trees were detected on the Kaibab National Forest (415 acres). In New Mexico, spruce beetle-caused tree mortality was detected on the Carson (300 acres), Cibola (230 acres), Santa Fe (510 acres), and Lincoln (150 acres) National Forests and Mescalero Apache (45 acres) Indian Resevation.

Insects: indigenous
Western Pine Beetle, *Dendroctonus brevicomis*
Arizona, New Mexico
Host: Ponderosa pine

Western pine beetle-caused tree mortality increased nearly twofold, from 6,480 acres in 1996 to 12,210 acres in 1997. Mortality on Federal lands in Arizona occurred on the Apache-Sitgreaves (7,630 acres) National Forests and the Navajo (1,945 acres) and Fort Apache (1,815 acres) Indian Reservations and in New Mexico on the Cibola (35 acres) and Gila (785 acres) National Forests.

Insect and Disease Complex: indigenous
Large Aspen Tortrix, *Choristoneura conflictana*; Western Tent Caterpillar; *Malacosoma californicum*; Marssonina Leaf Blight, *Marssonina populi*.
Arizona, New Mexico
Host: Aspen

Aspen defoliation caused by this complex of insects, diseases, and abiotic factors decreased slightly from 35,650 acres in 1996 to 20,915 acres in 1997. Defoliation on Federal lands in Arizona occurred on the Apache-Sitgreaves (820 acres), Coconino (305 acres), Kaibab (930 acres), and Tonto (160 acres) National Forests and Navajo (25 acres) and Fort Apache (460 acres) Indian Reservations. In New Mexico, aspen defoliation was detected on the Carson (10,185 acres), Cibola (2,080 acres), and Santa Fe (5,550 acres) National Forests and Mescalero Apache (280 acres) and Santa Clara (120 acres) Indian Reservations.

Insects: indigenous
Western Spruce Budworm, *Choristoneura occidentalis*
Arizona, New Mexico
Host: True firs, Douglas-fir, and Spruce

Western spruce budworm defoliation increased nearly twofold, from 126,985 acres in 1996 to 217,510 acres in 1997. In Arizona, western spruce budworm defoliation was detected on 1,090 acres of susceptible host type on the Kaibab National Forest. In New Mexico, western spruce budworm defoliation was detected on the Carson (156,325 acres), Santa Fe (20,230 acres), Gila (240 acres), and Lincoln (40 acres) National Forests; the Santa Clara Indian Reservation (280 acres); and on 39,305 acres of mixed State and private lands in northern New Mexico.

Insects: non-indigenous (?)
Spruce Aphid, *Elatobium abietinum*
Arizona
Host: Spruce

Spruce aphid defoliation increased from 10,780 acres in 1996 to 27,950 acres in 1997. In Arizona, defoliation occurred on both the Apache-Sitgreaves National Forests (11,805 acres) and the Fort Apache Indian Reservation (16,165 acres).

Insects: non-indigenous
European Gypsy Moth, *Lymantria dispar*
Arizona, New Mexico
Hosts: Hardwoods

No adult male gypsy moths were captured in Arizona or New Mexico in 1997.

Diseases: indigenous
Annosus root disease, *Heterobasidon annosum*
Arizona, New Mexico
Hosts: True firs, ponderosa pine

Root diseases and their associated pests may be responsible for about one-third of the conifer mortality in the Region. Annosus root disease accounts for about 20 percent of this mortality.

Diseases: indigenous
Armillaria root disease, *Armillaria* species
Arizona, New Mexico
Hosts: Douglas-fir, ponderosa pine, true firs, spruce, aspen

Armillaria spp. account for about 80 percent of root disease mortality across the Region. The disease is more prevalent in mixed conifer and spruce-fir forests than in ponderosa pine forests. Region 3 is tracking the long-term affects and spread of this and other root diseases on a number of sites using a series of permanent plots.

Diseases: indigenous
Black stain root disease, *Leptographium wageneri* varieties
New Mexico
Hosts: Pinyon pine, Douglas-fir

Both *Leptographium wageneri* var. *wageneri*, which infects pinyon, and *L. wageneri* var. *pseudotsugae*, which infects Douglas-fir, are rare in the Southwestern Region. The former has only been confirmed in two isolated areas in northern New Mexico, while the latter has been observed on a single site in southern New Mexico.

Diseases: indigenous
Dwarf Mistletoes, *Arceuthobium* spp.
Arizona, New Mexico
Hosts: pines, Douglas-fir, spruce, true firs

Dwarf mistletoes are the most significant pathogens in the Southwestern Region. Over one million acres of National Forest commercial timberlands in each state have some level of infection. The disease also affects several hundred thousand acres in non-commercial and reserved areas, woodlands, and other public and private forest lands. Region 3 is monitoring the disease on several sites using permanent plots. Over the past few years, the Region has been active in developing new management recommendations for this disease.

Diseases: non-indigenous
White pine blister rust, *Cronartium ribicola*
New Mexico
Hosts: Southwestern white pine

Blister rust occurs throughout most of the range of southwestern white pine (*Pinus strobiformis*) in the Sacramento, White, and Capitan Mountains of southern New Mexico. Roughly one-half million acres are affected. The disease has not been found in other parts of New Mexico or in Arizona. A hazard rating system is being developed for the outbreak area. In 1997, seed was collected from several resistant candidates for genetic testing.

Diseases: indigenous
Ponderosa pine needle cast, *Lophodermella cerina*
Arizona, New Mexico
Hosts: Ponderosa pine

Needle cast was detected on a total of 2,575 acres in 1997 compared to 2,200 acres in 1996 . Needle cast discoloration in Arizona was detected on BLM lands in the Arizona Strip (90 acres), and the Coconino National Forest (10 acres). In New Mexico, needle cast discoloration was detected on the Gila (2,200 acres) and Santa Fe (275 acres) National Forests.

Abiotic damage
Arizona
Hosts: all species

Drought damage was detected on a total of 957 acres in 1997, compared with over 61,000 acres the previous year. Damage was observed on the Coconino (520 acres) and Coronado (437 acres) National Forests.

Table for Submitting Data for part 1 of Calendar Year 1997 Conditions Report

Region:3 Date: February 5, 1998 Name of Preparer(s): Terry Rogers/Dave Conklin

Pest	State	Land Ownership Class	Acres (M) Infested	Volume Killed (MCF)	Number of Trees (M) Killed
DM	AZ	1	1040		
		2	674		
		3	25		
	NM	1	1440		
		2	348		
		3	581		
RDS	AZ	1	219	2	
		2			
		3			
	NM	1	860	2.6	
		2			
		3			

1=NF Land
2= Other Federal
3=State & Private

Table for Submitting Data for part 2 of Calendar Year 1997 Conditions Report

Region:3 Date: February 5, 1998 Name of Preparer(s): Terry Rogers/Dave Conklin

Pest	State	Land Ownership Class	Acres (M) Infested	Volume Killed (MCF)	Number of Trees (M) Killed
MPB	AZ	1	0	6	0.1
		2	10	263	5.2
		3	-	-	-
	NM	1	0.1	16	0.3
		2	-	-	-
		3	-	-	-
WSB	AZ	1	1.1		
		2	-		
		3	-		
	NM	1	177		
		2	0.3		
		3	39		

1=NF Land
2= Other Federal
3=State & Private